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Omalu e-mail to Hamilton and DeKosky. **How naive they had been:** Interviews with Omalu, Hamilton, and DeKosky, 2012.

CHAPTER 9

Paper Number 5: Elliot J. Pellman et al., "Concussion in Professional Football, Part 5," *Neurology*, Nov. 2004. **A number of conclusions:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 5," *Neurology*, Nov. 2004. **Confidential documents:** The NFL produced the documents on Oct. 28, 2004, in response to discovery requests for "all other benefit claims for TBD (total and permanent disability) in which the Plan participant has asserted that: (1) the claim is based on mental disability, and (2) the mental disability was alleged to have resulted from repetitive trauma to the head or brain from League football activities." The NFL listed 11 such claims (besides Webster's) and produced incomplete case histories for several. The players' names were blacked out. It is impossible to tell from the documents the total number of players who received benefits from the NFL on the basis of claims of mental disability related to football. **One was Gerry Sullivan:** Sullivan's case history shows that he was awarded benefits for both mental and orthopedic disabilities. An independent psychiatrist determined that Sullivan was totally and permanently disabled "due to cognitive impairment and behavioral disinhibition." A neurologist brought in by the NFL disagreed. The retirement board granted benefits on the basis of the reports of the psychiatrist and an orthopedist. **The appellate court:** *Jani v. Bert Bell/Pete Rozelle NFL Player Retirement Plan*, Fourth Circuit Court of Appeals, unpublished opinion, Dec. 13, 2006. **So far as to declare:** David C. Viano et al., "Concussion in Professional Football, Part 10," *Neurology*, Dec. 2005. **Virtually worthless:** "Study of Ex-NFL Players Ties Concussion to Depression Risk," *New York Times*, May 31, 2007. **Numerous studies:** J. S. Delaney et al., "Concussion during the 1997 Canadian Football League Season," *Clinical Journal of Sports Medicine*, 2000; J. S. Delaney et al., "Concussions among University Football and Soccer Players," *Clinical Journal of Sports Medicine*, 2002. **At his alma mater:** Guskiewicz brought up the NFL midway through his commencement speech to emphasize the need for "perseverance, surrounding yourself with good people, and carefully making decisions." He said: "In 2005 and 2007, I published (along with a group of 5 colleagues) two research papers that have defined my career as a neuroscientist. The findings of my research outlined in these papers appeared to be incriminating toward arguably one of the most popular and profitable industries in America—professional football, yes—the NFL. Our four-year study identified a high probability of developing later life cognitive impairment and depression once a player had sustained 3 or more concussions during their NFL career. It was the last thing the NFL wanted to hear, and the league's own medical committee immediately began dismissing our findings and trying to hire other doctors and scientists to 'put out the fire.' The NFL was in damage control mode. Its committee members began pointing fingers at our research and even initiated its own study. This was 'industry-funded research' at its

best. Members of the league's committee even suggested that we were out to ruin the game of football. It was a difficult time for our group, because we knew our research was solid, and we refused to be intimidated and just walk away. The irony of this is that my 3 boys were playing Pop Warner Football at the time, and if I wanted to paint this ugly picture of the game—would I really allow my own children to participate in the sport? All along, we had claimed that our goal was to identify risk factors for concussion and long-term effects to help improve the game and to help preserve the sport of football." **Protector of the league:** Bob Cantu interview, 2012. **Conclusions of NFL Paper Number 6:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004. **The response:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004 (comments). **A lark:** Bill Barr interview, 2012. **Coauthored a chapter:** Mark R. Lovell and William Barr, "American Professional Football," *Traumatic Brain Injury in Sports*, pp. 209–219. **Madison Square Garden:** Barr interview, 2012. **He was incredulous:** Barr interview, 2012. **Pellman later denied:** "Doctor Yes," *ESPN The Magazine*, Oct. 28, 2006. **Barr began to contact:** Barr e-mail correspondence with Rick Naugle, Chris Randolph, and John Woodward. **This was false:** "Doctor Yes," *ESPN The Magazine*, Oct. 28, 2006. **Lovell denied:** Mark Lovell interview. **Maroon seemed taken aback:** Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004 (comments). **A letter to his dean:** Letter from Barr to Richard I. Levin, Vice Dean for Education, Faculty and Academic Affairs, NYU School of Medicine, April 29, 2005. **Five papers in as many months:** "Concussion in Professional Football," Parts 4–8, ran monthly between Oct. 2004 and Feb. 2005 in *Neurosurgery*. Committee members told the authors that the NFL project evolved into a series of 16 papers but that no specific number was originally planned. **Concussions were so minor:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 7," *Neurosurgery*, Jan. 2007. **Concussion prone:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 12," *Neurosurgery*, Feb. 2006. **For \$500,000:** "NFL Helmet Manufacturer Warned on Concussion Risk," *Frontline*, May 1, 2013. This article, written by Sabrina Shankman, was part of a reporting partnership between *Frontline* and ESPN's *Outside the Lines*. The original article can be found at pbs.org/wgbh/pages/frontline/sports/concussion-watch/nfl-helmet-manufacturer-warned-on-concussion-risk; and espn.go.com/espn/otl/story/_id/9228260/report-warned-riddell-no-helmet-prevent-concussions-nfl-helmet-maker-marketed-one-such-anyway/. A confidential report: Report from Chris Withnall, senior engineer, Biokinetics, prepared for Riddell Inc., Nov. 15, 2000. **Full stop:** *Frontline*, May 1, 2013. **Riddell provided the helmets:** Mark Lovell interview, 2012. **Collins, who led the study:** Micky Collins et al., "Examining Concussion Rates and Return to Play in High School Football Players Wearing Newer Helmet Technology: A Three-Year Prospective Cohort Study," *Neurosurgery*, Feb. 2006. **A blistering commentary:** Micky Collins et al., "Examining Concussion Rates and Return to Play in High School Football Players Wearing Newer Helmet Technology: A Three-Year Prospective Cohort Study," *Neurosurgery*, Feb. 2006 (comments).

CHAPTER 10

Apuzzo continued to rubber-stamp: Cantu, the section editor, said other peer reviewers were recruited to evaluate the papers after he and Guskiewicz refused; the publication of the NFL concussion series continued until just before the MTBI committee was disbanded. **Agreed to publish Omalu's paper:** Omalu e-mails. **Support Cantu's theory:** Cantu interview, 2012. **The torturous review process:** Omalu e-mails and interview, 2012. **An original version:** Omalu and Hamilton e-mails. **The paper was published:** Bennet I. Omalu et al., "Chronic Traumatic Encephalopathy in a National Football League Player," *Neurosurgery*, July 2005. **Donald Marion:** Omalu interview, 2012; Hamilton e-mails; Donald Marion interview, 2012. **Omalu wrote to his colleagues:** Omalu e-mail to DeKosky and Hamilton. **The NFL's letter:** Ira R. Casson, Elliot J. Pellman, and David C. Viano, "Correspondence," *Neurosurgery*, May 2006. **A shot of Johnnie Walker Red:** Omalu interview, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **He did some quick research:** Omalu interview, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **Omalu e-mailed:** Hamilton e-mails. **Hamilton wasn't at all amused:** Hamilton interview, 2012, and e-mails. **The men exchanged e-mails:** Hamilton e-mails. **Dug further into the history:** Omalu, Hamilton, and DeKosky interviews, 2012. **He had discovered another case of CTE:** Omalu, Hamilton, DeKosky, and Wecht interviews; Hamilton e-mails. **Terry Long killed himself:** Long autopsy report. **Long was like Webster:** Long biography from ProFootballReference.com; Bailes interview, 2012; "Long, Terrence L," *TribLive*, obituaries; and "Long Carries His Weight with Steelers," *Pittsburgh Press*, Aug. 6, 1985. **Tested positive for steroids:** "Long's Road Back," *Pittsburgh Post-Gazette*, Dec. 4, 1991. **Dramatic downward spiral:** Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*; "Final Days Were Troubled for Former Steeler," *Pittsburgh Post-Gazette*, June 10, 2005. **Ground Zero:** "Heads Up," *Pittsburgh Post-Gazette*, Sept. 7, 2000. Upon launching the UPMC concussion program, Micky Collins told Chuck Finder: "What we really want to do is make Pittsburgh ground zero." **The autopsy:** Dr. Abdulrezak Shakir interview, 2012; Long autopsy; Omalu interview, 2012. **Omalu repeated the process:** Bennet I. Omalu et al., "Chronic Traumatic Encephalopathy in a National Football League Player: Part II," *Neurosurgery*, Nov. 2006. **Omalu sent the slides to Hamilton:** Omalu and Hamilton interviews, 2012; Hamilton e-mails. **He went straight to the media:** "Wecht: Long Died from Brain Injury; Had Head Trauma from NFL Days," *Pittsburgh Post-Gazette*, Sept. 14, 2005. **The NFL responded swiftly:** "Surgeon Disputes Findings; Disagrees with Wecht That Football Killed Long," *Pittsburgh Post-Gazette*, Sept. 15, 2005. **Wecht called Omalu at home:** Omalu and Wecht interviews, 2012. **A 1987 letter written by Maroon:** "Cause of Death Sparks Debate," *Pittsburgh Post-Gazette*, Sept. 16, 2005. **Even more confusing:** "Suicide Ruling in Long's Death Hasn't Ended Controversy," *Pittsburgh Post-Gazette*, Jan. 26, 2006. **Finishing touches:** Hamilton e-mails. **Omalu, Hamilton, and DeKosky wrote:** Bennet I. Omalu et al., "Correspondence," *Neurosurgery*, May 2006. **Published the Long study six months later:** Bennet I. Omalu et al.,

"Chronic Traumatic Encephalopathy in a National Football League Player: Part II," *Neurosurgery*, Nov. 2006. **The phone rang at Omalu's desk:** Omalu and Bailes interviews, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*, 2008. **Bailes told Omalu:** Bailes and Omalu interviews, 2012. **One of Cantu's former patients:** Chris Nowinski and Omalu interviews, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **A new breed of Dissenter:** Nowinski biography from Nowinski interview, 2012; Christopher Nowinski, *Head Games: Football's Concussion Crisis*. **Killer Kowalski's Pro Wrestling School:** www.killerkowalskis.com. **"A dynamic individual":** Cantu interview, 2012. **Nowinski was checking SI.com:** Nowinski interview, 2012. **Andre Waters:** Biography from ProFootballReference.com; "Pro Football's Necessary Headaches to NFL Players," *Philadelphia Inquirer*, Oct. 30, 1994. **Nowinski played a hunch:** Nowinski interview, 2012. **While trying to get his book published:** Nowinski and Alan Schwarz interviews, 2012. **Primarily a baseball writer:** Schwarz interview, 2012; Alan Schwarz, *The Numbers Game: Baseball's Lifelong Fascination with Statistics*, 2005. **The story on the Waters results:** This account of the background on how the Andre Waters story developed is drawn from 2012 interviews with Schwarz, Nowinski, and Omalu. **Waters had brain damage:** "Expert Ties Ex-Players' Brain Damage to Football," *New York Times*, Jan. 18, 2007. **When Bailes contacted Omalu:** Bailes and Omalu interviews, 2012. **Omalu and Maroon had struck a truce:** Omalu and Maroon interviews, 2012; Hamilton e-mails. **Gathered in Hamilton's office:** This account of the meeting is drawn from 2012 interviews with Omalu, Bailes, Hamilton, DeKosky, and Maroon.

CHAPTER 11

Profoundly affected: Harry Carson interview, 2012. **"Dick in the dirt":** Harry Carson, *Captain for Life*, p. 209 (electronic). **No player had hit him harder:** Harry Carson, *Captain for Life*, p. 184 (electronic). He confessed: Carson interview, 2012. **He went back:** "Two Authors of N.F.L. Study on Concussions Dispute Finding," *New York Times*, June 10, 2007. **Riddell developed PowerPoint presentations:** A history of the controversial Revolution helmet study, Riddell's marketing strategy, and the relationship between Riddell and ImPACT is summarized in a partial opinion issued in Riddell's lawsuit against Schutt. The court established a series of "undisputed facts," which included the findings that Riddell provided salary support for Collins and Lovell; ImPACT agreed not to sell concussion software at "any places in conflict with Riddell"; ImPACT agreed to pay Riddell for any sale "completed through a Riddell initiated contact"; and data compiled in 2002 and 2003, the first two years of the three-year study, produced "nearly identical concussion rates" in Year 1 and a difference that was "not statistically significant" in Year 2. The opinion granted Riddell summary judgment to toss out Schutt's claims that Riddell falsely advertised the concussion-reducing properties of the Revolution helmet. Schutt "has failed to identify literally false statements or show that it has been harmed by plaintiff statements," Judge Barbara B. Crabb wrote. See *Riddell*,

Inc. v. Schutt Sports, Inc. **The two pieces ran:** "I don't want anyone to end up like me; Plagued by postconcussion syndrome and battling an amphetamine addiction, former Patriots linebacker Ted Johnson is a shell of his former self," *Boston Globe*, Feb. 2, 2007; and "Dark Days Follow Hard-Hitting Career in N.F.L.," *New York Times*, Feb. 2, 2007. The main difference in the two pieces was MacMullan's revealing interview with Belichick. The Patriots' coach declined comment to the *Times*. **"88 Plan":** "Wives United by Husbands' Post-N.F.L. Trauma," *New York Times*, March 14, 2007. **Many elderly people:** *New York Times*, March 14, 2007. **1982 study:** Ira R. Casson et al., "Neurological and CT Evaluation of Knocked Out Boxers," *Journal of Neurology, Neurosurgery, and Psychiatry*, 1982. **Sports Illustrated brought in Casson:** Robert Boyle and Wilmer Ames, "Too Many Punches, Too Little Concern," *Sports Illustrated*, April 11, 1983. **In a 2010 article:** Ira R. Casson, "Do the 'Facts' Really Support an Association between NFL Players' Concussions, Dementia and Depression?" *Neurology Today*, June 3, 2010. **Goldberg said he walked away thinking:** Bernard Goldberg interview, 2013. **Inherited a nightmare:** Bob Stern interview, 2013. **After taking office:** Don Van Natta Jr., "His Game, His Rules," *ESPN The Magazine*, March 5, 2013. **"Why did they ask you?":** Julian Bailes interview, 2012. **The daylong meeting:** Unless otherwise noted, this account of the NFL's tumultuous 2007 concussion summit comes primarily from interviews with Mark Lovell, Micky Collins, Julian Bailes, Kevin Guskiewicz, Bob Cantu, and Bill Barr. The timeline is drawn from a written agenda issued by the league to the participants. **"You're looking for an answer":** This quote is from an interview *Times* reporter Alan Schwarz conducted with Pellman and Casson. A recording of the interview was provided by Schwarz. **Goodell also weighed in:** "NFL Personnel Discuss Concussion Management," *St. Petersburg Times* (FL), June 20, 2007. **A bit heated:** Schwarz interview with Pellman.

CHAPTER 12

Omalu wanted to travel to Florida: Details of Florida trip from 2012 interviews with Omalu and Nowinski as well as their respective books. **A two-page document:** Document was provided by Nowinski. **Tossed around names:** Omalu and Nowinski interviews, 2012; Omalu e-mails. **"He can be trusted":** Omalu e-mails. **Omalu brought in his own champion:** The account of how SLI was formed is drawn from interviews with Omalu, Nowinski, Bailes, and Fitzsimmons, and Omalu e-mails. **Resurrected his own concussion summits:** Leigh Steinberg, Nowinski, Omalu, and Bailes interviews, 2012; 2007 National Concussion Summit pamphlet. **"Timing time bomb":** "Steinberg Labels Concussions 'Time Bomb,'" Associated Press, April 20, 2007. **More disturbing story to tell:** Omalu, Nowinski, Bailes, Lovell, and Guskiewicz interviews, 2012; Omalu PowerPoint presentation. **Sights on the brain of another player:** Bailes and Nowinski interviews, 2012; Omalu e-mails. **Steelers offensive lineman:** Strzelczyk biography from ProFootballReference.com; "What Drove Justin Strzelczyk to His Death?" *Pittsburgh Post-Gazette*, Oct. 21, 2004. **He remembered Strzelczyk:** Bailes interview, 2012. **Schwarz had another**

story: "Lineman, Dead at 36, Exposes Brain Injuries," *New York Times*, June 15, 2007. **The NFL needed a new strategy:** Peter Davies interview, 2012, and e-mails. **Bailes continued to be shaken:** Colleen Bailes and Julian Bailes, interview, 2012. **Casson set out to find an independent expert:** Davies interview, 2012. **A leader in Alzheimer's research:** www.einstein.yu.edu; DeKosky interview, 2012. **Met with the committee at the NFL's headquarters:** Davies interview, 2012. **West Virginia University:** Details of the meeting and the events that followed are from 2012 interviews with Davies, Omalu, Bailes, and Maroon; Omalu and Davies e-mails; the PowerPoint presentation Davies prepared for the NFL; and "Game Brain," *GQ*, Oct. 2009. **"What are you going to do about this?":** This account of Jason Luckasovic's friendship with Omalu and the early conversations about the NFL lawsuit are from 2012 interviews with Luckasovic and Omalu. **On September 18, 2007:** Transcripts from "Oversight of the NFL Retirement System," hearing convened by the Senate Committee on Commerce, Science, & Transportation. **His name was Dave Duerson:** Biography from ProFootballReference.com; Duerson testimony; "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011. **A screaming match:** "Dave Duerson Knew Nothing about Concussions and Players' Best Interests," www.concussioninc.net, Feb. 24, 2011. **Charged with assaulting his wife:** "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011.

CHAPTER 13

Chris Benoit: "The Last Days of Chris Benoit," *Maxim*, Nov. 14, 2007; "Steroids Discovered in Probe of Slayings, Suicide," Associated Press, June 27, 2007. **"I knew him well":** Nowinski e-mail to Omalu and others. **Within days of the murders:** Nowinski interview, 2012, and Omalu e-mails. **ESPN crew showed up:** Arty Berko and Omalu interviews, 2012. **Riddled with CTE:** Omalu, Nowinski, Bailes, Cantu, and Fitzsimmons interviews, 2012. **Raise its national profile:** Omalu and Nowinski interviews; Omalu e-mails; "Why Did Wrestler Kill Wife, Son, Self," *Larry King Live* transcripts, Sept. 6, 2007. **Larry could take only one brain researcher:** Omalu, Nowinski, Bailes, and Fitzsimmons interviews, 2012. **The ESPN piece:** "Brain Chasers," ESPN, *Outside the Lines*, July 28, 2007. **Almost from the beginning:** Omalu and Nowinski interviews, 2012. **SLI began to split apart:** This account of the split is drawn from 2012 interviews with Nowinski, Omalu, Bailes, Cantu, and Fitzsimmons. **"Our Story":** www.sportslegacy.org. **Nowinski had made the connection:** Nowinski and Stern interviews, 2012. **Her name was Ann McKee:** Details of McKee's biography were drawn from interviews with Ann McKee, Chuck McKee, Nowinski, Cantu, and Stern, 2012; "The Woman Who Would Save Football," *Grantland*, Aug. 17, 2012; and www.bu.edu. **Appleton:** "A Place to Place," *Sports Illustrated*, Aug. 11, 1986. **During her Alzheimer's studies:** Ann McKee interview, 2012. **Nowinski got McKee her first brain:** McKee and Nowinski interviews, 2012. **John Grimsley:** Biography derived from ProFootballReference.com; "Former Oiler Grimsley Found Shot to Death," *Houston Chronicle*, Feb. 6, 2008; "Ex-Oilers

Shocked by Loss of Teammate Grimsley," *Houston Chronicle*, Feb. 6, 2008; "Football-Related Head Injuries Affect Players' Loved Ones," *Houston Chronicle*, Oct. 25, 2008. **Two days later, Nowinski called:** Nowinski and McKee interviews, 2012. **She was excited:** McKee interview, 2012. **Her first call:** Ann McKee and Chuck McKee interviews, 2012. **Schwarz broke the story:** "12 Athletes Leaving Brains to Concussion Study," *New York Times*, Sept. 23, 2008. **Omalu was in Lodi:** Omalu interview, 2012. **A Shakespearean drama:** Details surrounding case against Wecht and Omalu's involvement derived from 2012 interviews with both men as well as Shakir and Dominick; "Timeline: The Investigation and Trial of Cyril H. Wecht," *Pittsburgh Post-Gazette*, Jan. 27, 2008. **Brain Injury Research Institute:** Interviews with Omalu, Bailes, Fitzsimmons, and Garrett Webster, 2012. **Another former NFL player died young:** Tom McHale biography from Lisa McHale interview, 2012; ProFootballReference.com; "Ex-Buccaneer Tom McHale Found Dead at 45," *Tampa Bay Times*, Sept. 25, 2008; "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009. **The Omalu Group got to McHale's family first:** Omalu e-mails; Nowinski and Omalu interviews, 2012. **Nowinski called Omalu:** Details of the Omalu Group's agreement with Nowinski and subsequent contact with McHale's family are derived from Omalu's e-mails. **Trying to contact Omalu:** Nowinski interview, 2012. **Go public with the results:** Nowinski and Lisa McHale interviews, 2012. **The press conference:** Details derived from Nowinski, McKee, and Lisa McHale interviews, 2012; "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009; "Sixth NFL Player's Brain Is Found to Have Brain Damage," *New York Times*, Jan. 28, 2009; BU-CSTE press release. **Learned of BU's announcement on TV:** Omalu interview, 2012. **Coming-out party as a spokeswoman:** "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009.

CHAPTER 14

It was that kind of call: McKee interview, 2012. **She asked if Nowinski could attend:** McKee and Nowinski interviews, 2012. **Another expert in neurodegenerative disease:** Daniel Perl interview, 2012; www.hjfcp3.org/military-medical-symposium/symposium-files/Daniel%20Perl-%20MD.pdf. **McKee was nervous but excited:** McKee interview, 2012. **NFL headquarters:** This account of McKee's presentation to the MTBI committee is drawn from 2012 interviews with McKee, Perl, Nowinski, Henry Feuer, Colonel Michael Jaffee, and John Mann. **Call her brother:** Ann McKee and Chuck McKee interviews, 2012. **The young Pittsburgh lawyer:** Luckasovic interview, 2012. **The league could fall back on:** Collective Bargaining Agreement, specifically the role of the retirement board. **One such case:** "Seeing Is Believing," *Sports Illustrated*, June 9, 2003; "Orlando Brown, Who Sued the N.F.L. over Errant Flag, Dies at 40," *New York Times*, Sept. 23, 2011. **Line up consultants:** Luckasovic interview, 2012; contract with Nowinski. **Questions lingered:** "Researchers Consulted with Law Firms," ESPN.com, April 6, 2013. **Fear-case:** Luckasovic interview, 2012. **Goldberg, Persky & White:** www.gpwlaw.com.

Time to fish around: Luckasevic interview, 2012. **Houston-based firm:** "Vioxx Jury Awards \$253 Million in Damages," *Houston Chronicle*, Aug. 20, 2005. **Lanier's lawyers ultimately pulled out:** Luckasevic interview, 2012. **A big win:** "Former Dolphins Receiver O.J. McDuffie Wins \$11.5 Million in Malpractice Lawsuit," *Sun-Sentinel* (Fort Lauderdale), May 5, 2010. **Tierney was right:** Luckasevic interview, 2012. **A big gun in Los Angeles:** Tom Girardi interview, 2012; www.girardikeese.com; "Erin Brockovich: The Real Story," *Salon*, April 14, 2000. **NFL Paper Number 16:** Anders Hamburger et al., "Concussion in Professional Football, Part 16," *Neurosurgery*, June 2009. **Another confounding story:** "Dementia Risk Seen in N.F.L. Players Study," *New York Times*, Sept. 29, 2009. **Announced that it would hold hearings:** "Congress to Hold Hearing on N.F.L. Head Injuries," *New York Times*, Oct. 2, 2009. **Democratic committee staffers:** Details of the setup for the hearing and the NFL's reactions are derived primarily from a 2012 interview with Eric Tamarkin, who at the time was counsel to the committee. **"Will's Bill":** Dick Benson testimony. **"Rebel with a cause":** "N.F.L. Players with Head Injuries Find a Voice," *New York Times*, Oct. 28, 2009. **The packed hearing:** Transcripts from written and oral testimony before the committee. **Linda Sanchez:** Biography from www.lindasanchez.house.gov; and "Sanchez Sisters to Make History in the House," womennews.org, Nov. 19, 2002. **On a shelf in his office at BU:** Nowinski interview, 2012. **400 law firms:** Dan Zegart, *Civil Warriors* (Delacorte Press, 2000), p. 202. **180,000 research papers:** Dan Zegart, *Civil Warriors*, p. 296. **Tobacco fight's version of Omalu:** Dan Zegart, *Civil Warriors*, p. 37. **Started in the morgue:** Ernst Wynder biography: cdc.gov/mmwr/preview/mmwrhtml/mm4843bx.htm. **Among the 62 mice still alive:** Ernst Wynder et al., "Experimental Production of Carcinoma with Cigarette Tar," *Cancer Research*, 1953. **Research group:** Dan Zegart, *Civil Warriors*, p. 37. **"Savage the other side":** Dan Zegart, *Civil Warriors*, p. 38. **"A front":** Victor DeNoble interview, 2012. **A "metaphysical quarrel":** Dan Zegart, *Civil Warriors*, p. 38. **"NFL equals Tobacco":** Stern interview, 2012. **"Graziously" resigned:** "Co-Chairmen of NFL Concussion Panel Resign," Associated Press, Nov. 25, 2009. **Several changes to its concussion policy:** "NFL Changes Return to Play Rules for Concussions," Associated Press, Dec. 3, 2009; "New N.F.L. Rule on Concussions Benches Injured," *New York Times*, Dec. 3, 2009. **The headline that the NFL never wanted to see:** "Is Tackle Football Too Dangerous for Kids to Play?" *New York Times* blog, Nov. 30, 2009. **A guest column:** "Listening to Wisdom from a 10-Year-Old Son about His Head Injury," *New York Times*, Nov. 28, 2009. **A wire report:** "NFL to Ask Its Players to Donate Brains for Study," Associated Press, Dec. 20, 2009. **Schwarz was surprised:** Details of Schwarz's reaction and his call to Aiello derived from 2012 interview with Schwarz. **Nowinski on the phone:** Schwarz and Nowinski interviews, 2012. **The timing of the NFL's announcement:** Nowinski interview, 2012. **The following headline:** "N.F.L. Acknowledges Long-Term Concussion Effects," *New York Times*, Dec. 21, 2009. **Sent a bottle of champagne to BU:** Nowinski interview, 2012.

CHAPTER 15

"Started from zero": Dr. Mitchel Berger interview, 2012. **Head, Neck and Spine Committee:** "NFL Picks Two New Co-Chairs of Concussion Committee," Associated Press, March 18, 2010. **A two-page letter:** The framed letter is posted on the wall at the offices of the BU Center for the Study of Traumatic Encephalopathy, 2012. **A full-fledged member:** Guskiewicz interview, 2012. **Appointing brain surgeons:** "NFL Picks Two New Co-Chairs of Concussion Committee," Associated Press, March 18, 2010. **Ellenbogen:** Dr. Rich Ellenbogen interview, 2012; "Taking Brain Injuries out of Sports," *Seattle Magazine*, Fall/Winter 2012. **Batjer:** Dr. Hunt Batjer interview, 2012. **Batjer and Ellenbogen professed to know very little:** Batjer and Ellenbogen interviews, 2012. **At odds with Ellenbogen's review:** Anders Hamburger et al., "Concussions in Professional Football, Part 16," *Neurosurgery*, Aug. 2007 (comments). **"Like the same old NFL":** "House Panel Criticizes New N.F.L. Doctors," *New York Times*, May 24, 2010; "Panel Criticizes NFL on Safety Research," Associated Press, May 24, 2010. **A man in exile:** Omalu interview, 2012. **BU's researchers literally kept a file:** Stern interview, 2012. **Omalu's exaggerations:** Cantu interview, 2012. **Nowinski was no more charitable:** Transcripts, *Dennis & Callahan Radio Show*, Oct. 14, 2010. **A writer for GQ:** Jeanne Marie Laskas interview, 2012. **Never recognizing the need to filter:** Lovell and Guskiewicz interviews, 2012. **Ban on tackle football:** Cantu interview, 2012; "Preventing Sports Concussions Among Children," *New York Times*, Oct. 7, 2012. **"He got steamrolled":** Collins interview, 2012. **The league's biggest threat:** Bailes interview, 2012. **Omalu's marginalization:** Carson interview, 2012. **On February 17, 2011:** Details of Duerson's death and the scene at the condo from Sunny Isles Beach Police Department Incident/Investigation Report, Feb. 17, 2011; Tregg and Alicia Duerson interviews, 2012; excerpts of texts to Alicia Duerson; excerpts of letter left by Duerson. **Cast a proxy vote:** Mike Webster disability lawsuit court records. **Copy of Sports Illustrated:** "Concussions: The Hits That Are Changing Football," *Sports Illustrated*, Nov. 1, 2010. **A DVD case:** "Trapped: Haitian Nights," *The Movie Database*. **"Football's First Martyr":** "Dave Duerson: Football's First Martyr Can't Die in Vain," *Time*, Feb. 25, 2011. **A star scholar-athlete:** Duerson biography, both rise and fall, derived from Alicia Duerson, Tregg Duerson, and Harold Rice interviews, 2012; "You Have to Accept My Pain: An Interview with Dave Duerson Three Months before His Suicide," *Deadspin*, Feb. 23, 2011; "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011; ProFootballReference.com; bankruptcy records. **Duerson had a radio show:** *Double Time with Double D* radio show, VoiceAmerica, Oct. 21, 2010. **Donating his father's brain:** Details of Duerson family efforts to donate his brain are from 2012 interviews with Tregg Duerson, Alicia Duerson, Kelly Woods, and David Krichavsky. **NFL wasn't nearly as unified:** Berger, Ellenbogen, Batjer, and Guskiewicz interviews, 2012. **BU's rock star:** "The Woman Who Would Save Football," *Grantland*, Aug. 17, 2012. **Conference in Las Vegas:** "Chronic Traumatic Encephalopathy," conference in Las Vegas, Sept. 30–Oct. 1, 2012. **Their most ominous**

assertions: McKee, Cantu, Stern, and Nowinski interviews, 2012. **If CTE was occurring at a deep level:** McKee interview, 2012; Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **One of BU's main critics:** Berger interview, 2012; http://neurosurgery.ucsf.edu/index.php/about_us_faculty_berger.html. **Wasn't a single recorded case:** Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **Self-selecting quality:** McKee, Cantu, Berger, and Ellenbogen interviews, 2012. **"With all due respect":** Cantu interview, 2012. **"The facts are the facts":** Nowinski interview, 2012. **Steer Duerson's brain:** Batjer interview, 2012. **From the new committee's inception:** Ellenbogen, Guskiewicz, and Berger interviews, 2012. **A press conference:** "Duerson's Brain Trauma Diagnosed," *New York Times*, May 2, 2011. **"Drove him to suicide":** McKee interview, 2012. **"I just can't even believe this":** McKee interview, 2012.

CHAPTER 16

Two dozen clients: Ron Feenberg interview, 2011. **A new front:** "Former Pro Athletes Battle against Bill Limiting Workers' Comp," *Sacramento Bee*, April 16, 2013. **A fierce lobbying campaign:** The NFL, with support from the other major sports leagues and 16 California teams, rallied around AB 1309, a bill that would close the loophole. On April 24, 2013, the bill passed out of the California State Assembly's Insurance Committee by a unanimous 11–0 vote and was headed to the full assembly for debate. **Brady and... Brees:** "Injured Pro Athletes Deserve Workers' Comp," *San Francisco Chronicle*, June 24, 2013. **Luckasevic had found:** Jason Luckasevic interview, 2012. **One of the first... cases:** Jeanne Marie Laskas, "The People V. Football," *GQ*, March 2011. **On July 19, 2011:** See *Vernon Maxwell, et al. v. National Football League, et al.*, Superior Court of the State of California, July 19, 2011. **"We thought maybe":** Tom Girardi interview, 2012. **The next month:** *Charles Ray Easterling and his wife, Mary Ann Easterling, et al. v. National Football League, Inc.*, U.S. District Court for the Eastern District of Pennsylvania, Aug. 17, 2011. Later, the Easterling suit would be described in some accounts as the first brain injury case to be filed against the NFL. It was the first to be filed in federal court, where all the cases were later consolidated. **"I won't remember":** "Taking Its Toll," *Outside the Lines*, March 16, 2012. **Painfully familiar:** "Death Isn't the End," *New York Times*, May 4, 2012. **Riddled with CTE:** "Football Player Who Killed Himself Had Brain Disease," *New York Times*, July 27, 2012. **By the time the results were released:** Nathan Fenno and Luke Rosiak of the *Washington Times* compiled the most comprehensive database on the lawsuits, a working online document that allows users to explore the plaintiffs by team, position, and number of seasons played. The database can be found at: washingtontimes.com/footballinjuries/; the website NFLConcussionLitigation.com has maintained the most current information about the lawsuits and the plaintiffs. **50 military service members:** G. Wolf et al., "The Effect of Hyperbaric Oxygen on Symptoms after Mild Traumatic Brain Injury," *Journal of Neurotrauma*, 2012. **Medieval-sounding device:** Julian Bailes interview, 2012.

Pilot study: Gary W. Small et al., "PET Scanning of Brain Tau in Retired National Football League Players: Preliminary Findings," *American Journal of Geriatric Psychiatry*, 2013. **Nearly every NFL team:** The ImPACT website lists many of the company's clients. See ImpactTest.com. **Two heart attacks:** Mark Lovell interview, 2012. **His own research:** Maroon coauthored a study on the use of natural plant extracts to neutralize the chemical reaction that leads to brain disease. See Russell L. Blaylock and Joseph Maroon, "Natural Plant Products and Extracts That Reduce Immunoexcitotoxicity-Associated Neurodegeneration and Promote Repair within the Central Nervous System," *Surgical Neurology International*, 2012. **A letter to the FTC:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **One mouth guard:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **An endorsement:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **"No significant data":** Testimony of Jeffrey S. Kutcher, Senate Commerce Committee, Oct. 19, 2011. **"Don't forget to take your fish oil!":** Peter Davies e-mail correspondence. **FTC ordered:** Letter from Mary K. Engle, the FTC's associate director for advertising practices, to John M. Shanahan, CEO, Newport Nutritionals, Inc., Nov. 7, 2012. **Closed its investigation:** Letter from Engle to John E. Villafranco, *The First 50 Years. Their own words: The First 50 Years*, pp. 39–83. **A coffee table book: organ":** "Steve Sabol, Cinematic Force for N.F.L., Dies at 69," *New York Times*, Sept. 18, 2012. **Origin story:** Michael Oriard, *Brand NFL*, pp. 14–18. **"NFL football is real":** Oriard, *Brand NFL*, p. 14. **Swallowed his tongue:** Andy Russell, *A Steeler Odyssey*, p. 15. **Summer of 2012:** E-mail from Clare Graff, NFL Communications, to Lorraine Esposito. **"He really wanted to know":** Lorraine Esposito interview, 2013. **Dumb Mom:** Amanda Rodriguez interview, 2013. **Two helmets crashing:** *New York Times*, Oct. 21, 2010. **Pull a commercial:** "Unhappy NFL Prods Toyota to Edit TV Ad," Reuters, Jan. 19, 2011. **Pointed out:** On Feb. 4, 2013, Crossman tweeted: "So far I have found three players in the NFL's safety evolution commercial from last night who are suing the league over concussions."

CHAPTER 17

Hunched over a microscope: Bennet Omalu interview, 2012. **Raised in a violent ghetto:** Award-winning sportswriter Jill Lieber Steeg wrote one of the first lengthy profiles on Seau's unlikely rise to NFL stardom for *Sports Illustrated* in 1993. After Seau's suicide, she produced an exhaustive two-part series on the events leading up to his death. See Jill Lieber, "Hard Charger," *Sports Illustrated*, Sept. 6, 1993, and "Junior Seau: Song of Sorrow," *San Diego Union-Tribune*, Oct. 14, 2012. **12 yards deep:** Gary Plummer interview, 2013. **Seau was loud:** The account of Seau's personality changes and the final years of his life is drawn primarily from interviews with members of Seau's family, including three of his four children and Gina Seau, his ex-wife; Bette Hoffman, former director of the Junior Seau Foundation and the

executor of his will; and Lieber's *Union-Tribune* articles. **When police arrived:** Junior Seau autopsy report, Aug. 20, 2012. **Placed on a gurney:** The account of the events in Seau's house after his death and Tyler Seau's phone call with Bennet Omalu and Julian Bailes is from interviews with Tyler Seau, Bette Hoffman, Joe Davis, Bennet Omalu, and Julian Bailes. **At 8:38 that night:** E-mail correspondence between Tyler Seau and Bennet Omalu. **Chargers' doctor:** E-mail correspondence between Tyler Seau and Bennet Omalu. **Chao had his own issues:** The Medical Board of California website contains detailed records of the allegations against Chao and issues surrounding his drinking. See: mbc.ca.gov. For additional details of Chao's checkered history, see "The Chargers' Doctor Is a Drunk Quack. Why Haven't They Fired Him?" *Deadspin*, April 24, 2013. On June 13, 2013, Chao stepped down after 17 years as the Chargers' doctor. "I talked to the Chargers about my back problems in March and my desire to spend more time with my newborn twins and young daughter," Chao said in a statement released by the team. **At least a half dozen:** Craig Nelson interview, 2013. **Prusiner placed calls:** Prusiner's interest in obtaining part of Seau's brain is confirmed in e-mails and interviews with Bennet Omalu and Joe Davis. **I empathize:** Peter King interview, 2013. **Nelson told Omalu:** Nelson interview, 2013. **Soot and the imprint:** Seau autopsy report, Aug. 20, 2012. **Persona non grata:** Bennet Omalu interview, 2012. **Celebratory e-mail:** E-mail correspondence between Bennet Omalu and Stanley Prusiner. **Nowinski emphasized:** Tyler Seau interview, 2013. **At the center of the league's effort:** The account of the NFL's effort to take control of Seau's brain is drawn from interviews with Tyler Seau, Bette Hoffman, Gina Seau, Kevin Guskiewicz, Rich Ellenbogen, Russell Lonser, and others familiar with the negotiations. **An early draft:** Bob Fitzsimmons interview, 2013. **Got a call:** Gary Plummer interview, 2013. **That was certain:** "Doctors: Junior Seau's Brain Had CTE," ESPN.com, Jan. 11, 2013. **I still love football:** Jake Seau interview, 2013.

EPILOGUE

A proposal: The section on Gary Huber's dealings with Big Tobacco is drawn from Dan Zegart, *Civil Warriors*, 2000; and Robert N. Proctor, *Golden Holocaust*, 2011. **50 confirmed cases:** Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **43 percent:** Associated Press, Aug. 7, 2012. **No genius:** Matt Chaney e-mail to authors, 2013. **Dispensed paid advice:** "Researchers consulted with law firms," ESPN.com, April 6, 2013. **Had given way:** "Concussion Kickoff: Oral Arguments Held in NFL Concussion Litigation," NFLconcussionlitigation.com, April 10, 2013. **Guiding strategists:** *United States of America v. Philip Morris USA Inc.*, District Court for the District of Columbia Judge Gladys Kessler, Aug. 17, 2006, p. 97. **Directed litigation:** Ibid., p. 68. **Whitecoats:** Robert Proctor, *Golden Holocaust*, p. 545, and "Proposal for the Organization of the Whitecoat Project," Bates 3990006961/3990006964, at the University of California, San Francisco Legacy Tobacco Documents Library. See <http://legacy.library.ucsf.edu/tid/ecr82i00/pdf>. **Deep shit:** Robert

Proctor, *Golden Holocaust*, p. 303, and "Project Down Under: Conference Notes," June 24, 1987, Bates 2021502102-2134 (p. 4). See <http://legacy.library.ucsf.edu/tid/njh56b00/pdf>. **When he first arrived:** Jim Otto interview, 2012. **Descendant of the Roman gladiators:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 7. **A gash:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. viii. **Looking at a gargoyle:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 143. **Middle-aged horror show:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 2. **Probably end up killing him:** Otto interview, 2012. **I'm not a wimp-out:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 6.

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